

How to Study for Chapter 18 Pure Monopoly

Chapter 18 considers the opposite of perfect competition --- pure monopoly.

1. Begin by looking over the Objectives listed below. This will tell you the main points you should be looking for as you read the chapter.
2. New words or definitions and certain key points are highlighted in italics and in red color. Other key points are highlighted in bold type and in blue color.
3. You will be given an In Class Assignment and a Homework assignment to illustrate the main concepts of this chapter.
4. There are new calculations in this chapter. Go over each carefully. Be sure you understand how each number was derived (do the calculations for yourself). Then, plot the calculations on graph paper to see how the graphs are derived. Check your graphs against the ones in the text. The calculations of this chapter continue the same case from the calculations of the previous chapters (the case of the construction company). Pay particular attention to the relation of the marginal revenue and the price in the case of pure monopoly.
5. Go over the graphs very carefully. They will be very important throughout the remainder of the course. There is one major difference between the graph of pure monopoly and that of perfect competition.
6. When you have finished the text, the Test Your Understanding questions, and the assignments, go back to the Objectives. See if you can answer the questions without looking back at the text. If not, go back and re-read that part of the text. When you are ready, take the Practice Quiz for Chapter 18.

Objectives for Chapter 18 Pure Monopoly

At the end of Chapter 18, you should be able to answer the following:

1. What is meant by “**pure monopoly**”? by “**market power**”?
2. For a monopoly seller, what is the demand curve facing the company?
3. For a monopoly seller, what is the relation between the price and the marginal revenue? Why?
4. Given data representing the demand schedule for a monopoly seller, calculate the marginal revenue.
5. How does a monopoly seller decide on the quantity to produce and the price to charge?
6. On the monopoly graph, show the quantity produced (to maximize profits), the price charged, and the economic profits or losses. Consider both the short-run and the long-run.
7. What is wrong with the statement: “Because a company is a monopoly, it can charge any price that it wants.”?
8. What are the effects on a monopolist's decisions if there is a change in: (consider both an increase and a decrease)
 - a. the demand for the product
 - b. a variable cost of production
 - c. a fixed cost of production
8. Compare monopoly to perfect competition in terms of the benefits considered in Chapter 17.

Chapter 18 **Pure Monopoly** (latest revision July 2004)

We examined the extreme case of perfect competition in Chapters 16 and 17. Now we turn to its polar opposite: pure monopoly. As noted in Chapter 16, there are three main characteristics of pure monopoly. First, there is **only one seller** of the product ("mono" means "one"). Second, there are **few good substitutes** available for buyers. And third, there are high barriers to entry; if economic profits are being earned, it will be very **difficult for new sellers to enter** the industry. We can understand why there might be few substitutes for a product. But let us now consider why there might be high barriers to entry.

Barriers to Entry

There are many reasons for the existence of **high barriers to entry**. First, DeBeers has maintained its monopoly on diamond production through **control over the natural resource**. Virtually all of the diamond in the world has come into the control of this one company, owned by the Oppenheimer family of South Africa.

Second, for many years, IBM maintained close to a pure monopoly on mainframe computers through its **copyrighting** of computer languages. Copyrighting has also helped Microsoft maintain a near monopoly on operating systems. Xerox and Polaroid maintained near monopolies by **patenting** their processes.

Third, some companies have high barriers to entry because of the **very high costs of capital goods that are necessary**. Companies that produce a product that requires a large amount of machinery have **economies of scale**. This means that the larger companies can produce the product at a lower cost per unit. A new company that starts with a small number of buyers would not be able to compete on the basis of cost. We call these industries "**natural monopolies**" and will discuss them in detail in Chapter 19. Examples include gas and electric companies, telephone companies, bus companies, and so forth.

Fourth, in some industries, **vertical integration** can provide a barrier to entry. ***"Vertical integration" means that the same company controls many phases of the production process.*** Companies that refine oil into gasoline also own the oil wells and the tankers. They control the gasoline stations through a franchise agreement. Any company trying to compete would have to find its own oil, develop its own tankers for shipping, and create its own stations to sell the gasoline. General Motors also is vertically integrated. General Motors owns the companies that produced the automobile bodies, the batteries and sparkplugs, and the glass. This makes it much more expensive for a new company to try to compete. And Microsoft produces both computer operating systems and software programs. Is it any wonder that the operating system Windows was made purposely incompatible with Lotus 1-2-3, once the most popular spreadsheet in the world. (Microsoft produces a competing product --- Excel)

Fifth, in some industries, **continual innovation** can be a barrier to entry. Both IBM and AT&T were able to maintain near monopoly positions for many years by always being first with new ideas. Microsoft has carried on in this manner. But in the early 1980s, the hierarchical management of IBM was too slow to keep up with the need for innovation. Other companies came up with new and better products, causing IBM to lose almost half of its market share. As long as these companies were doing the best innovation, new competitors could not find a way into the market.

Finally, some industries had high barriers to entry because of **government regulations**. For

example, until the early 1980s, the Civil Aeronautics Board acted to prevent airlines from serving certain markets. And, until the mid-1970s, the Federal Communications Commission acted to prevent access to the airwaves to any new television network. Copyrights and patents also involve government policy.

The Business Decisions of a Pure Monopolist

In perfect competition, we had two demand curves to consider. One was the demand for the product. The other was the demand as seen by one typical seller of the product (perfectly elastic). In pure monopoly, the typical seller is the only seller. Therefore, the *demand as seen by one seller is the demand for the product*. We have only the one demand to consider. Go back to the case of the construction company from Chapter 16. Now let us assume that the construction industry becomes a pure monopoly. In our example, all 1,000 of the companies are now merged into one company. The demand for homes was given in Chapter 4 and then repeated in Chapter 16 (and is repeated below). Like any producer whose goal is to maximize profits, *a monopolist will produce that quantity at which the marginal revenue equals the marginal cost*. The marginal cost has not changed; the calculations are the same as in Chapter 14. Costs are not affected by the number of sellers in an industry. But *the marginal revenue is different*. In the following table, **we calculate the marginal revenue as the change in total revenue if there is a given change in quantity (change in total revenue divided by change in quantity). We calculate the total revenue as the price times the quantity.**

<u>Price</u>	<u>Quantity</u>	<u>Total Revenue</u>	<u>Marginal Revenue</u>	<u>Marginal Cost (from Chapter 14)</u>
\$340,000	0	0		
320,000	1,000	\$320 Million	\$320,000	\$160,000
300,000	2,000	600 "	280,000	140,000
280,000	3,000	840 "	240,000	120,000
260,000	4,000	1,040 "	200,000	140,000
240,000	5,000	1,200 "	160,000	160,000
220,000	6,000	1,320 "	120,000	180,000
200,000	7,000	1,400 "	80,000	200,000
180,000	8,000	1,440 "	40,000	220,000
160,000	9,000	1,440 "	0	240,000
140,000	10,000	1,400 "	-40,000	260,000
120,000	11,000	1,320 "	-80,000	280,000

Notice that this is different from the case of perfect competition. In perfect competition, the price and the marginal revenue are equal. *In monopoly, the price is greater than the marginal revenue*. This is a major difference.

Why is the price greater than the marginal revenue? If the price of houses is \$320,000, you sell 1,000 houses; the marginal revenue is \$320,000 per house. But to sell 2,000 houses, you must lower the price to \$300,000 **each**. You do not sell the first 1,000 houses at \$320,000 and the second 1,000 houses at \$300,000. You sell all 2,000 houses at \$300,000. Each of the second 1,000 houses (from 1,001 to 2,000) adds \$300,000 to total revenue. But to sell them all, the price on the first 1,000 houses must be lowered by \$20,000 (from \$320,000 to \$300,000). Therefore, the addition to total revenue (the marginal revenue) for each of the second 1,000 houses is

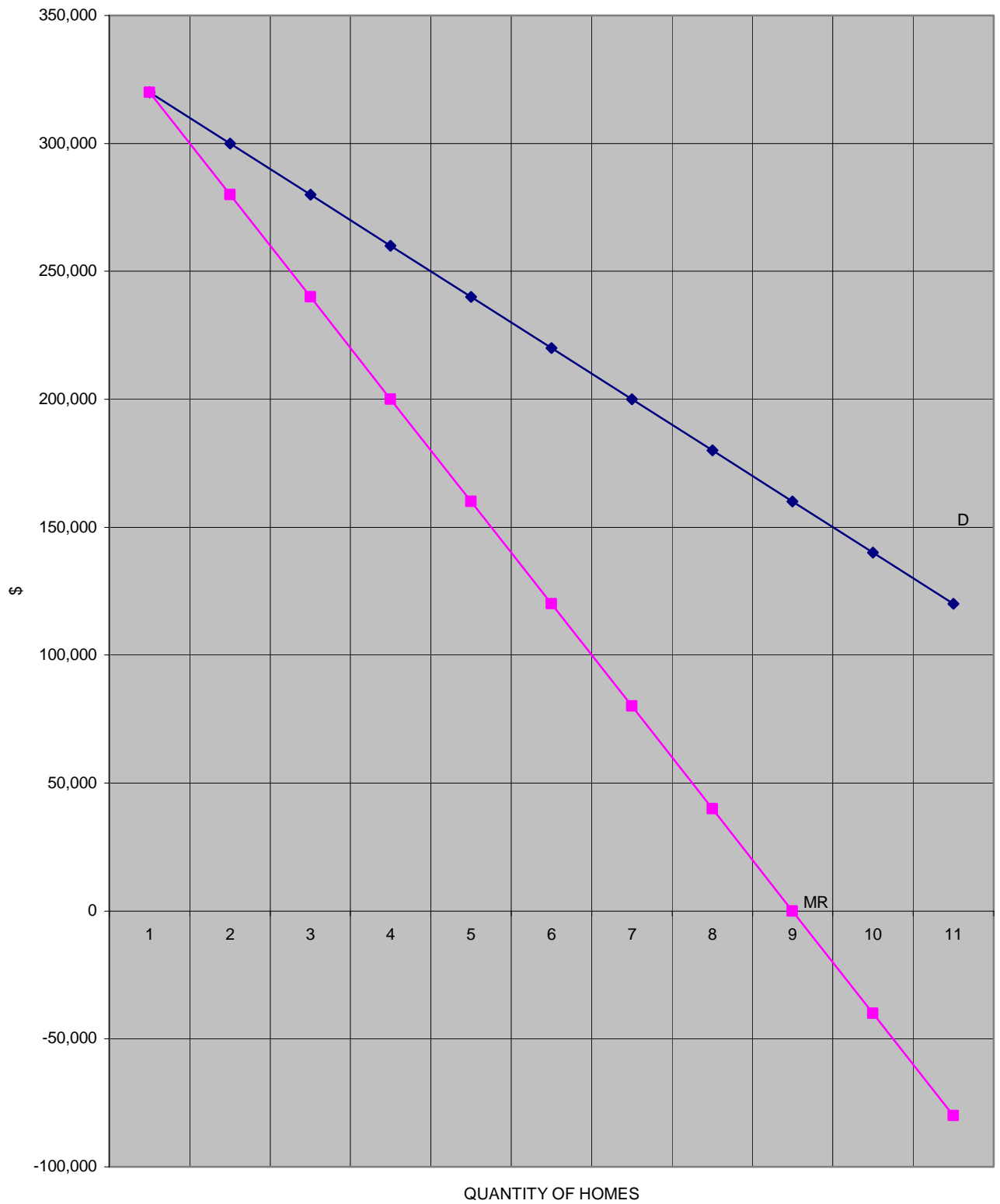
\$280,000 (\$300,000 minus \$20,000). Let's try this for the next 1,000 houses (from 2,001 to 3,000). To sell them, the price must be lowered to \$280,000 **each**. Each of these houses therefore adds \$280,000 to total revenue. But to sell them, the price on each of the other 2,000 houses must be lowered by \$20,000 (from \$300,000 to \$280,000). Thus, the addition to revenue (the marginal revenue) is only \$240,000.

Test Your Understanding

Explain why if we sell 4,000 houses, the price to sell them is \$260,000 each but the marginal revenue is only \$200,000. And explain why if we sell 5,000 houses, the price is \$240,000 each but the marginal revenue is only \$160,000.

We can **graph the demand and the marginal revenue** as shown below. Notice that **both are downward sloping but that the marginal revenue is below the demand**.

PRICE IS GREATER THAN MARGINAL REVENUE



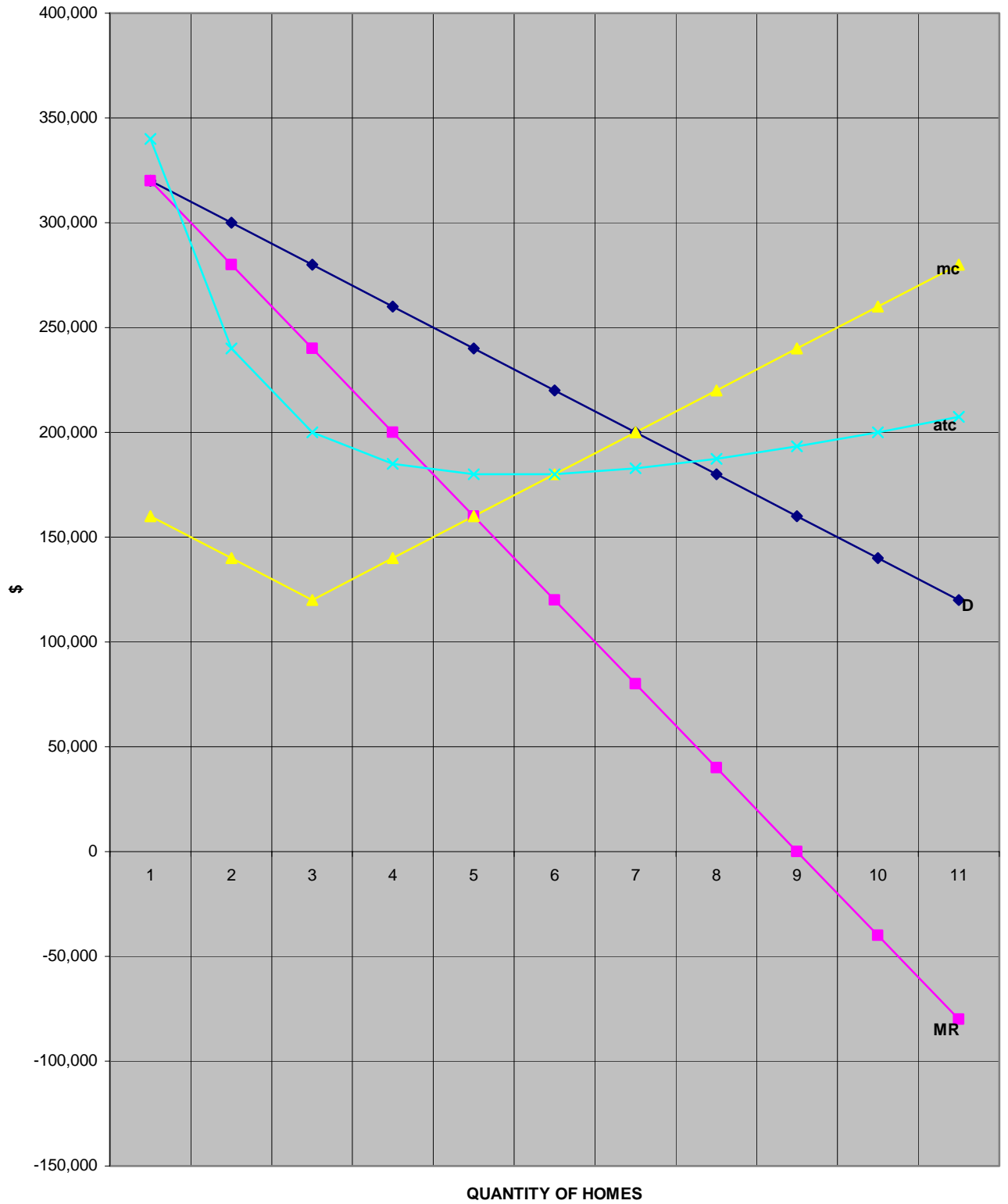
How many units will this profit-maximizing monopolist produce? Since the monopolist will produce that **quantity** at which the marginal revenue equals the marginal cost, the answer is 5,000 houses. **What price will be charged?** To sell 5,000 houses, the monopolist charges a price of \$240,000. The demand curve tells us that at the price of \$240,000, the quantity demanded is 5,000 houses. Notice that *even a monopolist cannot charge any price that is desired*. The monopolist is free to raise the price; however, if this is done, buyers will buy less. The loss in total revenue would exceed the saving in total cost and economic profits would fall. **Finally, what economic profit will be earned?** We calculate the economic profits as (price – average total cost) times quantity. Since the price is \$240,000 and average total cost is \$180,000, the profit per house is \$60,000. (To see that the average total cost is \$180,000 if 5,000 houses are produced, go back to the numbers in Chapter 14.) Since there are 5,000 houses, the total economic profits equal \$300 million (5,000 times \$60,000). And with high barriers to entry, no one will enter the industry to compete the profits away. *There is no long-run.*

Below, we combine the demand-marginal revenue graph above with the cost curves from Chapter 14. *The profit-maximizing quantity is obtained where the marginal revenue equals the marginal cost (point a). To find the price, DO NOT GO ACROSS FROM POINT A. Instead, you must go up to the demand from point a.* (Remember that the demand tells you how many units people will buy at any price. You already know that you want buyers to buy 5,000 houses. Going up to the demand tells to that buyers will buy that quantity at a price of \$240,000.) Point b allows you to find the price. Finally, the economic profit is calculated as before:

(Price - Average Total Cost) times Quantity.

The economic profit is shown as the area of the rectangle of which bcde shows the four corners. (\$240,000 - \$180,000) times 5,000 houses is equal to \$300 million.

MONOPOLY



Test Your Understanding

Return to the case of the orange grove from previous chapters. Assume that all groves sell their oranges through one cooperative. **This cooperative acts as a pure monopoly.** Assume that, at a price of \$1.50 per pound, the monopoly cooperative will sell 10,000 pounds of oranges. Every time the price is lowered by 5 cents per pound, another 10,000 pounds will be sold. This is shown below. **The average total cost and the marginal cost are repeated from the previous assignments.** (You will only need the numbers that are repeated below. You do not need any of the missing number.)

Quantity	Price	Total Revenue	Marginal Revenue	Average Total Cost	Marginal Cost
10,000	\$1.50			\$4.80	\$1.20
20,000	1.45				
30,000	1.40				
40,000	1.35			1.50	0.40
50,000	1.30				
60,000	1.25				
70,000	1.20				
80,000	1.15				
90,000	1.10			0.80	0.24
100,000	1.05				
110,000	1.00				
120,000	0.95				
130,000	0.90			0.65	0.30
140,000	0.85				
150,000	0.80				
160,000	0.75			0.60	0.40
170,000	0.70				
180,000	0.65			0.60	0.60
190,000	0.60				
200,000	0.55			0.72	6.00

The **quantity** that the monopolist will choose in order to maximize profits is _____.

Explain the reason that this quantity will be produced.

The **price** that this monopolist will charge is \$_____.

The **economic profits** that this monopolist will earn will equal \$_____.

Cases Using the Pure Monopoly Graph in Analysis

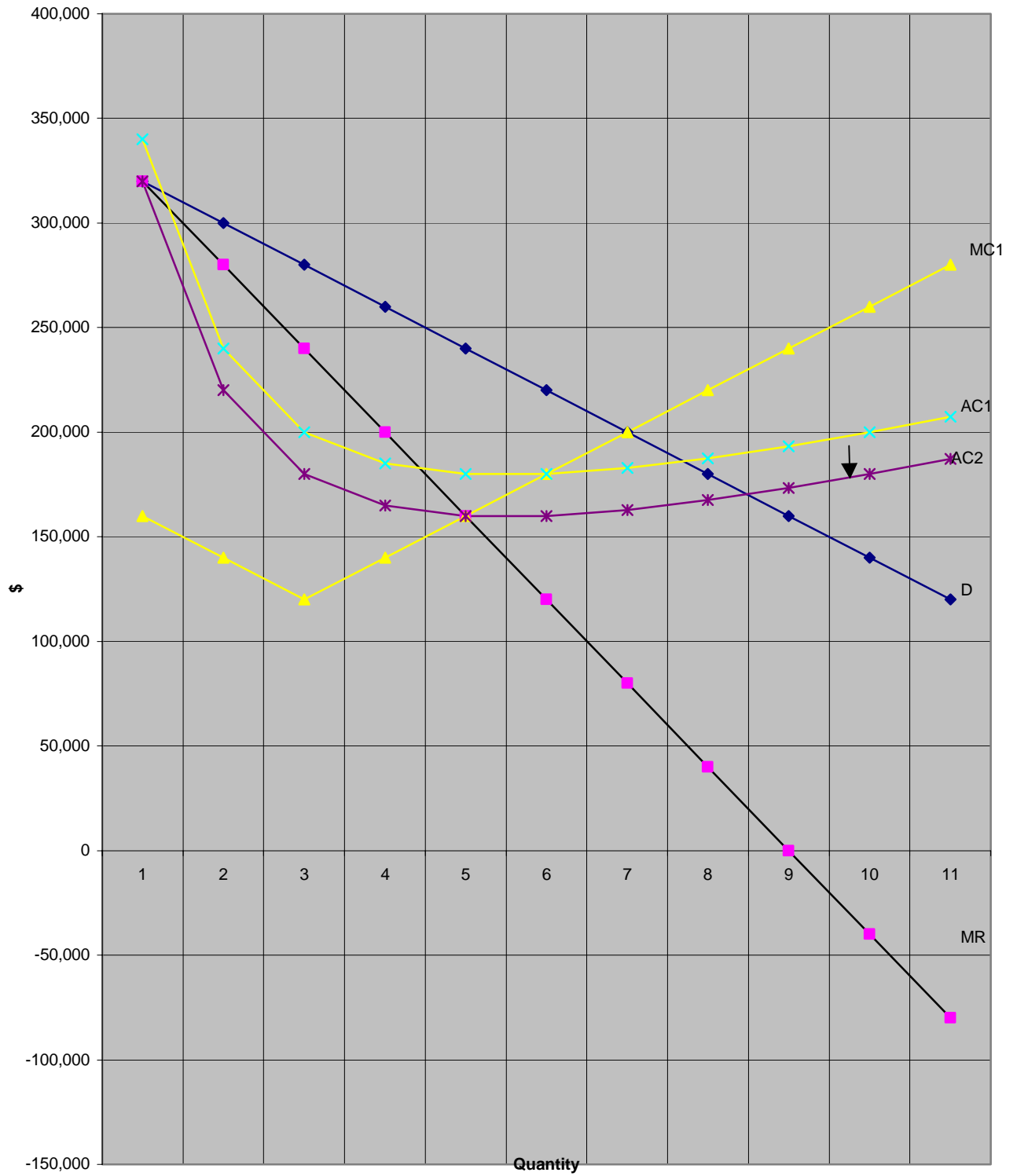
In the chapter on perfect competition, we saw that there could be a change in a fixed cost of production, a change in a variable cost of production, or a change in demand. In Chapter 17, we analyzed each possibility. Let us do the same here for the case of monopoly.

Case 1: A Decrease in a Fixed Cost

On the graph, show the result of a decrease in a fixed cost of production (for example, the cost of capital goods). What happens to the quantity, the price, and the economic profits?

Answer: this case is handled in the same way as it was in Chapter 17. This is shown on the graph below. *A decrease in a fixed cost of production lowers the average total cost but does not*

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Decrease in a Fixed Cost



change the marginal cost. Since neither marginal cost nor marginal revenue change, the **quantity does not change.** Since the demand does not change, **the price also remains the same.** **The economic profit rises by the amount of the decrease in the fixed cost.** The new economic profit is the area of the rectangle bfgc. There is no long-run because of the high barriers to entry.

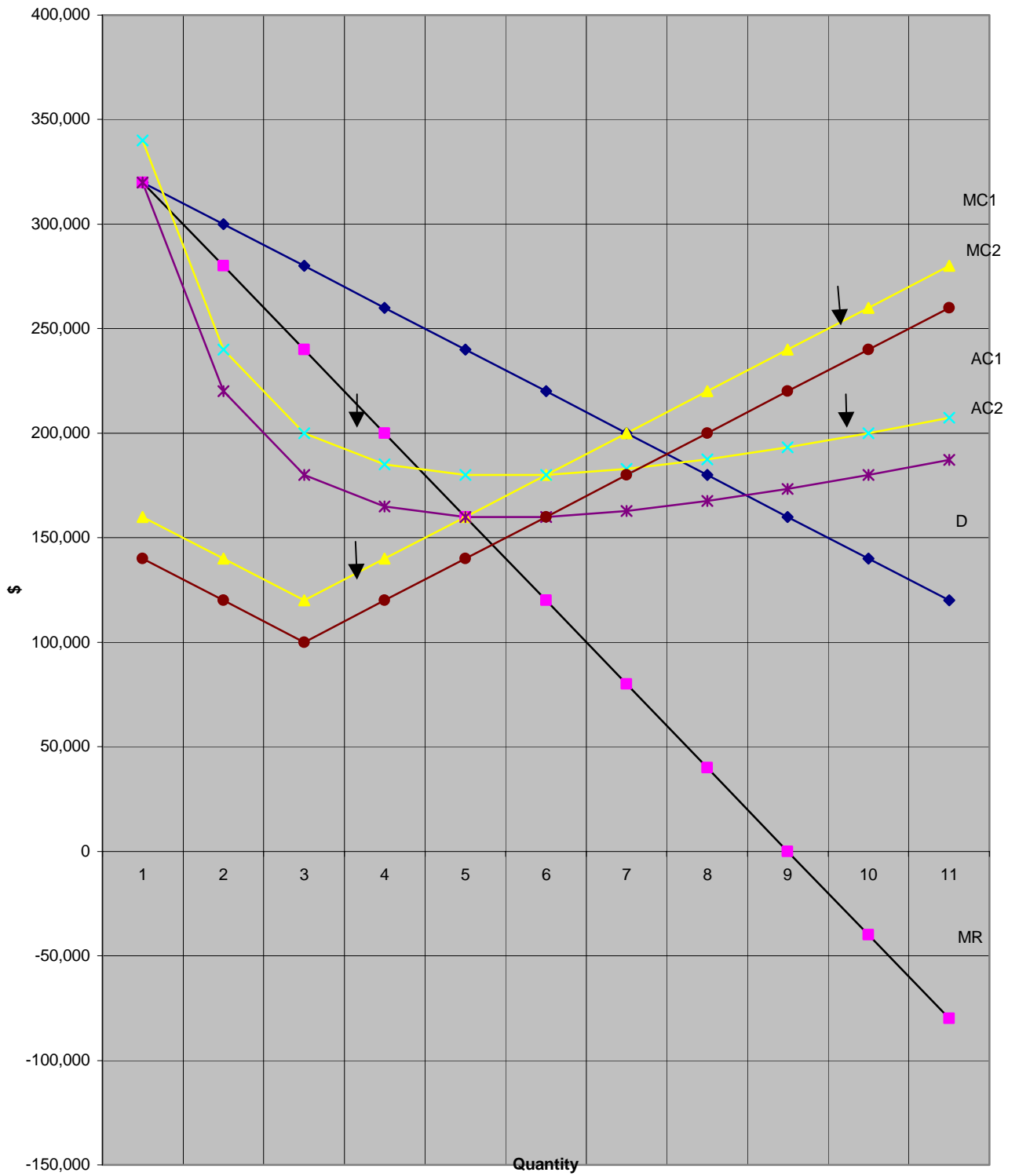
Case 2: A Decrease in a Variable Cost

On the graph, show the result of a decrease in a variable cost (for example, a cost of labor or of natural resources). What happens to the quantity, the price, and the economic profits?

Answer: this case is handled in the same way as it was in Chapter 17. This is shown in the graph on the next page. *A decrease in a variable cost decreases both the average total cost and the marginal cost.* The quantity that maximizes profits occurs where the marginal revenue equals the new marginal cost (point f). **The quantity has risen to Q_2 .** The price is determined by going from point f up to the demand curve (point g). **The price has fallen to P_2 .** *Notice that, even in monopoly, a decrease in labor costs or in costs of natural resources is only partially passed on to consumers as lower prices.* Finally, the new economic profits are shown by the area of the rectangle ghij. **The economic profits have risen.** In monopoly, unlike perfect competition in the long-run, sellers also gain from a reduction in a variable cost.

Decrease in a Variable Cost

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Case 3: An Increase in Demand

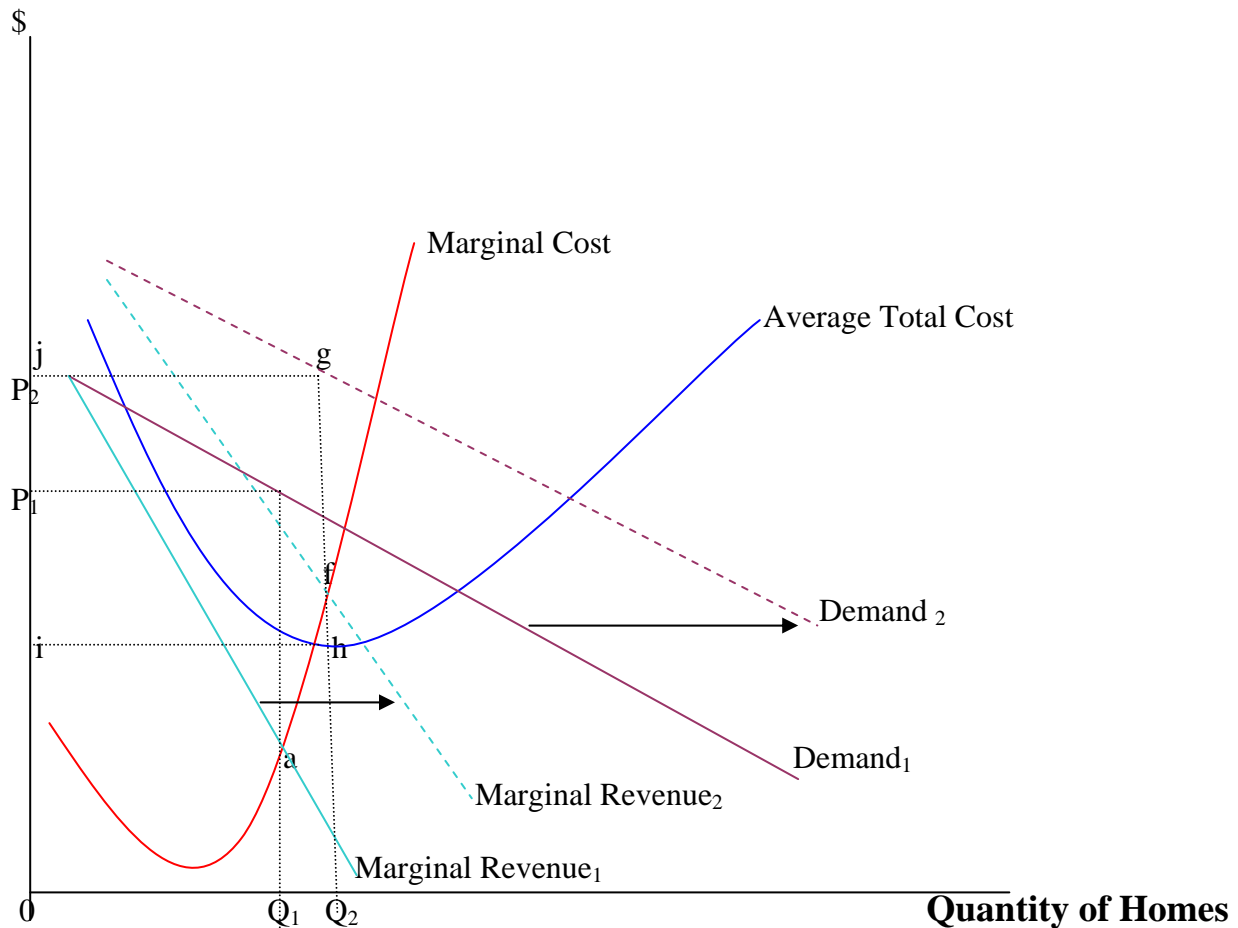
On the graph, show the results of an increase in the demand for the product. What happens to the quantity, the price, and the economic profits?

Answer: The demand curve shifts to the right. **The question here is: what happens to the marginal revenue? The answer is that it too shifts to the right.** To show this, let us assume that the demand doubles (this is shown as a doubling of the price people are willing to pay for each quantity). The –000s are omitted below.

Quantity	Price	Marginal Revenue	New Price	New Marginal Revenue
0	\$340	0	\$680	0
1,000	\$320	\$320	\$640	\$640
2,000	\$300	\$280	\$600	\$560
3,000	\$280	\$240	\$560	\$480
4,000	\$260	\$200	\$520	\$400
5,000	\$240	\$160	\$480	\$320
6,000	\$220	\$120	\$440	\$240
7,000	\$200	\$ 80	\$400	\$160
8,000	\$180	\$40	\$360	\$ 80
9,000	\$160	0	\$320	0
10,000	\$140	- \$40	\$280	- \$ 80
11,000	\$120	- \$80	\$240	- \$160

The shifts in demand and marginal revenue are shown in the graph on Page 13. *The profit-maximizing quantity is determined where the new marginal revenue equals the marginal cost (point f). The new quantity, Q_2 , is greater than the original quantity. The new price is determined by going from point f up to the new demand curve (point g). The new price, P_2 , is greater than the original price. Finally, the economic profits are calculated as the area of the rectangle ghij. The economic profits have increased.*

An Increase in the Demand For The Product



Explanation. An increase in the demand is a shift in the demand curve to the right (from Demand₁ to Demand₂). The profit-maximizing quantity is determined where the new marginal revenue equals the marginal cost (point f). The new quantity, Q_2 , is greater than the original quantity, Q_1 . For the price, go from point f up to the new demand curve (point g). The new price, P_2 , is greater than the original price, P_1 . Finally, the economic profits are calculated as the area of the rectangle $ghij$. The economic profits have increased.

Test Your Understanding

In the graph, draw the situation for a monopolist. Draw the demand, the marginal revenue, the average total cost, and the marginal cost curves. Show the profit-maximizing quantity, the price that should be charged, and the economic profits.

Then, there is **an increase in wages paid to workers**. Is this a change in demand, a change in a fixed cost, or a change in a variable cost? Show the results of this change on the graph. Show the new profit-maximizing quantity, price, and economic profits. For each of these, do they rise or fall?

Summary: The Social Problems of Monopoly

In Chapter 16, we considered the benefits to society from perfect competition. We can use these to evaluate why pure monopoly is bad for society as a whole. First, in perfect competition, companies could earn economic profits in the short-run but not in the long-run. ***In pure monopoly, because of the high barriers to entry, economic profits can be earned in the long-run as well.*** They do this by preventing new companies from producing products that buyers want to buy. As we will see in a later chapter, much of the wealth of the superrich has come from owning companies that were able to earn economic profits for a long time. Second, in perfect competition, companies would produce whatever quantity was being produced as efficiently as possible in the short-run. This is also true for a monopoly, as any waste reduces the company's profits. ***However, monopolies do not have as strong of an incentive to be efficient as there is no competitor who could drive them out of business.*** Evidence tends to show that monopolies are less efficient than companies with considerable competition. Third, in perfect competition, companies would reach ***productive efficiency in the long-run.*** This means that they would be driven to produce that quantity for which average total cost is at its lowest point. Looking at the graph will show you that this is not necessarily true for a pure monopoly. ***Except by coincidence, a monopoly company will produce at a higher cost per unit than would be found in a competitive company in the long-run.*** Fourth, in perfect competition, companies also had incentives to find ways to lower costs over time and to find ways to "improve" the products they sell. This is also true for monopolies. ***Both lower costs and "better" products will increase the profits of the monopoly,*** as shown in the cases above ("better" products increase the demand for the product). Indeed, several of the most innovative companies in America have been near monopolies. This would include Bell Labs (part of AT&T until 1996) and IBM. Finally, we saw that companies in perfect competition would realize ***allocative efficiency*** --- producing just the right quantity of each good. ***This would result because the price would equal the marginal cost.*** Examination of the graph shows you that, ***for a monopoly, the price is greater than the marginal cost. This is allocative inefficiency --- too little of the product is being produced from the point of view of the society.***

In summary, pure monopolies earn high economic profits for their owners by preventing other companies from producing the products that consumers want produced. They are less efficient. Therefore, the costs of production for pure monopolies are greater than the costs that would exist if they were forced to be competitive. And pure monopolies produce too little of a product --- consumers would be better off with more of that product. However, the company is not better off producing more of that product. The connection between self-interest and society's interest that is the essence of the "invisible hand" is broken. There is general agreement that pure monopolies are bad for society. Therefore, as we saw in Chapter 10, they are illegal in the United States.

Practice Quiz on Chapter 18

- For a monopoly, the demand curve facing the seller is
 - perfectly elastic
 - the marginal cost curve
 - the demand for the product
 - the marginal revenue curve
- For a **monopolist**, price is:
 - greater than marginal revenue
 - less than marginal revenue
 - equal to marginal revenue
 - sometimes greater and sometimes less than marginal revenue
- A monopoly company:
 - produces where the marginal revenue equals the marginal cost
 - can charge any price that it wants
 - will earn an economic profit of zero in the long-run
 - all of the above

Quantity	Price	Total Cost
1	\$100	\$ 80
2	95	170
3	90	270
4	85	380
5	80	500

This monopolist should produce:

- 1
 - 2
 - 3
 - 4
 - 5
- From the numbers in question 4, the **economic profits** of the monopolist equal:
 - \$20
 - \$40
 - \$60
 - \$100
 - 0
 - If a company is a monopoly and there is **an increase in a fixed cost of production**
 - the quantity produced falls
 - the price rises
 - the economic profits fall
 - all of the above
 - If a company is a monopoly and there is **an increase in a variable cost of production,**
 - the quantity produced falls
 - the price of the product rises
 - the economic profits fall
 - all of the above
 - If a company is a monopoly and there is **an increase in demand for the product,**
 - the quantity produced rises
 - the price of the product rises
 - the economic profits rise
 - all of the above
 - Compared to the case of perfect competition, a monopolist is more likely to:
 - charge a higher price
 - produce a higher quantity of the product
 - produce a quantity at which average total cost is minimized
 - all of the above
 - For a monopolist,
 - price equals marginal cost indicating the right quantity of the good is being produced for society
 - price is greater than marginal cost indicating that too little is being produced for society
 - price is less than marginal cost indicating that too much is being produced for society
 - price is sometimes greater than and sometimes less than marginal cost

Answers: 1. C 2. A 3. A 4. B 5. A 6. C 7. D 8. D 9. A 10. B